	Application No.	Applicant(s)
Notice of Allowability	10/601,480	BRUNDAGE ET AL.
	Examiner	Art Unit
	Dangelino N. Gortayo	2168

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--
All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *4/28/2006*.

2. ☒ The allowed claim(s) is/are *1-3, 5, 8-13, and 15-16 (now renumbered as 1-12)*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some*   c) ☐ None   of the:

        1. ☐ Certified copies of the priority documents have been received.

        2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

        3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

    * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.

    (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached

        1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.

    (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

    Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)

2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)

3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____

4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

5. ☐ Notice of Informal Patent Application (PTO-152)

6. ☒ Interview Summary (PTO-413), Paper No./Mail Date *7/18/06* .

7. ☒ Examiner's Amendment/Comment

8. ☒ Examiner's Statement of Reasons for Allowance

9. ☐ Other _____
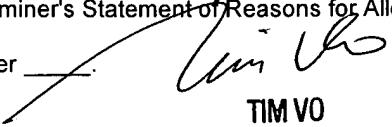
TIM VO
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

DETAILED ACTION

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes

and/or additions be unacceptable to applicant, an amendment may be filed as provided

by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be

submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview

with Mr. Jerome Schaefer on July 18, 2006.

The application has been amended as follows:

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in

the application:

LISTING OF CLAIMS:

1.   (Currently Amended) A method for constructing an optimal representation for an input
query, the method comprising:

receiving the input query, wherein the input query is an intermediate language
representation comprising nodes, each node having a respective node type;

examining the nodes in a left-depth first manner to identify node types for optimization;

tagging nodes corresponding to the identified node types;

moving upward to the next node until the intermediate language representation of the
input query has been examined in its entirety;

searching from the top of the intermediate language representation for tagged nodes and identifying ~~associated~~ code patterns to be optimized; and

adjusting the identified code patterns with improved code patterns to form an optimal representation for the input query,

<u>wherein the improved code patterns are generated using one or more translations comprising at least one of constant folding, logical rewrites, path rewrites, loop-invariant code rewrites, tuple rewrites, position rewrites, commutations, inlining and sort elimination.</u>

2.   (Original) The method of claim 1, wherein the receiving step comprises receiving a semantic intermediate language representation.

3.   (Original) The method of claim 2, wherein the semantic representation comprises a graph structure containing nodes.

4.   (Cancelled)

5.   (Currently Amended) A computer-readable medium having computer-executable instructions <u>executed by a processor</u> for performing a method for constructing an optimal representation for an input query, the method comprising:

receiving the input query, wherein the input query is an intermediate language representation containing code patterns and nodes, each node having a respective node type;

examining the nodes in a left-depth first manner to identify code patterns and node types which are subjects for optimization;

tagging the identified code patterns until the intermediate language representation of the input query has been examined in its entirety;

searching from the top of the intermediate language representation for tagged code patterns; and

adjusting the tagged code patterns with improved code patterns to form an optimal representation for an input query,

wherein the improved code patterns are generated using one or more translations comprising at least one of constant folding, logical rewrites, path rewrites, loop-invariant code rewrites, tuple rewrites, position rewrites, commutations, inlining and sort elimination.

6.   (Cancelled)

7.   (Cancelled)

8.   (Currently Amended) A computer system for generating an optimized representation of an XML intermediate language representation of one or more of input queries comprising:

one or more of input devices for receiving the one or more input queries;

one or more intermediate language compilers wherein each compiler generates an intermediate language representation of an input query;

an expression accumulator which combines each intermediate language representation into a single XML intermediate language representation; and

an optimizer performing the acts of:

receiving the input query, wherein the input query is an intermediate language representation containing code patterns and nodes, each node having a respective node type;

examining the nodes in a left-depth first manner to identify code patterns and node types which are subjects for optimization;

tagging the identified code patterns until the intermediate language representation of the input query has been examined in its entirety;

searching from the top of the intermediate language representation for tagged code patterns; and

adjusting the tagged code patterns with improved code patterns to form an optimal representation for an input query,

wherein the improved code patterns are generated using one or more translations comprising at least one of constant folding, logical rewrites, path rewrites, loop-invariant code rewrites, tuple rewrites, position rewrites, commutations, inlining and sort elimination.

9.   (Original) The system of claim 8, wherein the one or more input queries comprise one or more of an XML query and an XML view.

10.   (Original) The system of claim 8, further containing a post-optimization process portion forming query results, the system comprising:

one or more target generators wherein the optimized representation is transformed into one or more target representations forming target queries;

one or more data sources for querying over; and

one or more execution engines wherein the target queries are executed over the one or more data sources to produce query results.

11.   (Currently Amended) A method for constructing an optimal representation for an input query, the method comprising:

receiving the input query, wherein the input query is an intermediate language representation containing nodes, each node having a respective node type;

examining the nodes to inspect code patterns associated with respective node types;

comparing the inspected code patterns using a pattern match algorithm to detect non-optimized code patterns; and

adjusting one or more of the non-optimized code patterns and the inspected code patterns with improved code patterns to form an optimal representation for an input query,

wherein the improved code patterns are generated using one or more translations comprising at least one of constant folding, logical rewrites, path rewrites, loop-invariant code rewrites, tuple rewrites, position rewrites, commutations, inlining and sort elimination.

12.   (Original) The method of claim 11, wherein the receiving step comprises receiving a semantic intermediate language representation.

13.   (Original) The method of claim 12, wherein the semantic representation comprises a graph structure containing nodes.

14.   (Cancelled)

15.   (Currently Amended) A computer-readable medium having computer-executable instructions executed by a processor for performing a method for constructing an optimal representation for an input query, the method comprising:

receiving the input query, wherein the input query is an intermediate language representation containing nodes, each node having a respective node type;
        examining the nodes to inspect code patterns associated with respective node types;

comparing the inspected code patterns using a pattern match algorithm to detect non-optimized code patterns; and

adjusting one or more of the non-optimized code patterns and the inspected code patterns with improved code patterns to form an optimal representation for an input query,

wherein the improved code patterns are generated using one or more translations comprising at least one of constant folding, logical rewrites, path rewrites, loop-invariant code, tuple rewrites, position rewrites, commutations, inlining and sort elimination.

16.   (Currently Amended) A computer system for generating an optimized representation of
an XML intermediate language representation of one or more of input queries comprising:

one or more of input devices for receiving the one or more input queries;

one or more intermediate language compilers wherein each compiler generates an
intermediate language representation of an input query;

an expression accumulator which combines each intermediate language representation
into a single XML intermediate language representation; and

an optimizer performing the acts of:

receiving the input query, wherein the input query is an intermediate language
representation containing nodes, each node having a respective node type;

examining the nodes to inspect code patterns associated with respective node
types; ·

comparing the inspected code patterns using a pattern match algorithm to detect
non-optimized code patterns; and

adjusting one or more of the non-optimized code patterns and the inspected code
patterns with improved code patterns to form an optimal representation for an input query,
wherein the improved code patterns are generated using one or more translations comprising at
least one of constant folding, logical rewrites, path rewrites, loop-invariant code, tuple rewrites,
position rewrites, commutations, inlining and sort elimination.

REASONS FOR ALLOWANCE

The following is an examiner's statement of reasons for allowance:

Claims 1-3, 5, and 8-10 are allowable over the prior art of record because
the prior art of record fails to teach or fairly suggest searching from the top of the
intermediate language representation for tagged nodes and identifying associated
code patterns to be optimized; and adjusting the identified code patterns with
improved code patterns to form an optimal representation for the input query,
wherein the improved code patterns are generated using one or more translations
comprising at least one of constant folding, logical rewrites, path rewrites, loop-
invariant code rewrites, tuple rewrites, position rewrites, commutations, inlining
and sort elimination, as detailed in claim 1 and similarly to claims 5 and 8.

Claims 11-13 and 15-16 are allowable over the prior art of record because
the prior art of record fails to teach or fairly suggest comparing the inspected code
patterns using a pattern match algorithm to detect non-optimized code patterns;
and adjusting one or more of the non-optimized code patterns and the inspected
code patterns with improved code patterns to form an optimal representation for
an input query, wherein the improved code patterns are generated using one or
more translations comprising at least one of constant folding, logical rewrites,
path rewrites, loop-invariant code rewrites, tuple rewrites, position rewrites,
commutations, inlining and sort elimination, as detailed in claim 11 and similarly
to claims 15 and 16.

Any comments considered necessary by applicant must be submitted no later
than the payment of the issue fee and, to avoid processing delays, should preferably

accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dangelino N. Gortayo whose telephone number is (571)272-7204. The examiner can normally be reached on M-F 7:30-4:30.
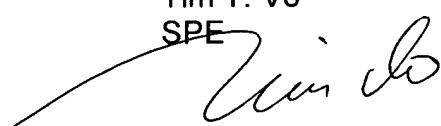
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim T. Vo can be reached on (571)272-3642. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Dangelino N. Gortayo
Examiner

𝒟𝐿

Tim T. Vo
SPE

TIM VO
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100